August 2009

Water Reclamation and Reuse Frequently Asked Questions

►*What is reclaimed water?*

Reclaimed water is wastewater, storm water or gray water that is treated to remove pollutants and pathogens that are potentially harmful to the environment or human health. Reclaimed water can be reused in a variety of ways for purposes that typically do not require drinking water quality. The greater the potential for public contact with reclaimed water, the more treatment and disinfection the water requires to protect public health.

►*What is the difference between wastewater, gray water and storm water for water reuse?*

Wastewater is untreated liquid containing domestic sewage and industrial waste. Wastewater comes from residential dwellings, commercial buildings, industrial and manufacturing facilities, and institutions.

Gray water is untreated household wastewater from bathtubs, showers, lavatory fixtures, wash basins, washing machines and laundry tubs. It does not include wastewater from toilets, urinals, kitchen sinks, dishwashers or laundry from soiled diapers.

Storm water is precipitation discharged across land to water or through conveyances to one or more waterways. It may include storm water runoff, snow melt runoff, surface runoff and drainage.

►*Who regulates reclaimed water in Virginia to protect human health and the environment?*

The Department of Environmental Quality regulates the reclamation and reuse of wastewater (www.deq.virginia.gov/vpa/waterreuse.html).

The Virginia Department of Health provides guidelines for the reuse of gray water and the potable reuse of harvested rainwater (www.vdh.state.va.us/EnvironmentalHealth/Onsite/index.htm).

The Department of Conservation and Recreation regulates the reclamation and non-potable reuse of storm water, including harvested rainwater (www.dcr.virginia.gov/soil_and_water/stormwat.shtml#support).

►*What treatment is required to reclaim wastewater for reuse?*

Generally, the greater the potential for public contact with reclaimed water, the greater will be the degree of treatment and disinfection needed for that water.

Reclaimed water may be produced from two kinds of wastewater, municipal and industrial. For municipal wastewater, there are two sets of treatment standards referred to as Level 1 and Level 2. Reclaimed water meeting Level 1 standards is more highly treated and disinfected and suitable for reuses with potential for public contact. Reclaimed water meeting Level 2 standards is not as highly treated and disinfected as Level 1 reclaimed water and is suitable for reuses where there is little or no potential for public contact.

Treatment required to reclaim industrial waste water depends on the types of pollutants in the wastewater and the potential for public contact with the reuses of that water. Reclaimed water treatment standards for industrial wastewater are determined on a case-by-case basis.

►*How can reclaimed municipal wastewater be reused?*

Water reclaimed from municipal wastewater may be reused in a variety of ways. The boxes below list acceptable reuses of reclaimed municipal wastewater that meets Level 1 and Level 2 standards.

Level 1 Reclaimed Water

- All types of landscape irrigation in public access areas (i.e., golf courses, cemeteries, public parks, school yards and athletic fields)
- Non-residential toilet flushing
- Fire fighting or protection and fire suppression in non-residential buildings
- Outdoor domestic or residential reuse (i.e., lawn watering and non-commercial car washing)
- Commercial car washes
- Commercial air conditioning systems
- Irrigation for any food crops not commercially processed, including crops eaten raw
- Landscape impoundments with potential for public access or contact
- Commercial laundries

Level 2 Reclaimed Water

- Irrigation for any food crops commercially processed
- Irrigation for non-food crops and turf, including fodder, fiber and seed crops; pasture for foraging livestock; sod farms; ornamental nurseries; and silviculture
- Landscape impoundments with no potential for public access or contact
- Soil compaction
- Dust control
- Washing aggregate
- Making concrete
- Livestock watering
- Aquaculture
- Stack scrubbing
- Street washing
- Boiler feed
- Ship ballast
- Once-through cooling towers
- Recirculating cooling towers

Some reuses of reclaimed municipal wastewater listed above may have additional restrictions. Other reuses not listed above may be approved by DEQ on a case-by-case basis.

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►*How can reclaimed industrial wastewater be reused?*

Because there are many industrial processes, there are many kinds of pollutants that can result in industrial wastewater. In most cases, it is possible to reclaim industrial wastewater for numerous reuses, such as those listed in the preceding boxes. However, the treatment needed to reclaim industrial wastewater may be different than the treatment needed to reclaim municipal wastewater for the same reuse, and would be determined on a case-by-case basis.

►*Can reclaimed water be reused for drinking water?*

In Virginia, reclaimed water cannot be sent directly to a drinking water distribution system for human consumption. Reclaimed water can be used for drinking water only when it is discharged to and combined with a surface water, such as a lake or stream, that is used for drinking water supply. After mixing, the combined reclaimed and surface water can be withdrawn, treated to meet drinking water standards and then distributed. This is referred to as indirect potable reuse.

►*Is a permit required to reuse reclaimed water?*

Facilities that generate and distribute water reclaimed from domestic, municipal or industrial wastewater require permits from the DEQ. End users, or persons and entities that reuse reclaimed water received directly from a facility that generates or distributes it, do not require a permit in most cases. However, end users are required to have a service agreement or contract with their reclaimed water provider, similar to other agreements required by utility companies, such as for sewerage service.

►*What will reclaimed water cost?*

In states where water reuse is well established, such as California and Florida, the cost of reclaimed water to end users is less than or equal to the cost of drinking water. The cost of reclaimed water to end users in Virginia is expected to follow the same pricing trends to encourage reuse of reclaimed water.

►*Why reuse reclaimed water?*

Water reuse can offer several potential benefits by:

- Conserving drinking water, the highest quality water, for human consumption
- Supplementing a community's overall water supply for other uses
- Providing an alternative affordable water source to end users that is less than or equal to the cost of drinking water
- Delaying the need for and cost of new or expanded drinking water resources and infrastructure
- Reducing the amount and cost of commercial fertilizer applied to sites irrigated with reclaimed water that contains nitrogen and phosphorus
- Ensuring a more reliable water supply, even during drought

Above: Loudoun County, VA – Color coded and labeled reclaimed water distribution piping

Reuse of reclaimed water for landscape impoundments

►*How does the Virginia DEQ ensure that water reclamation and reuse projects protect the environment and public health?*

When reclaimed water is properly treated, managed and reused for its intended purpose, it is safe for the environment and public health.

Generators of reclaimed water produced from domestic, municipal or industrial wastewater are required to obtain a permit from DEQ. The permit requires regular monitoring and reporting to verify compliance with appropriate reclaimed water standards.

Pipelines and associated equipment for the distribution of reclaimed water are required to be color coded and/or labeled to distinguish them from other pipelines, including drinking water distribution pipelines. The color coding standard for reclaimed water distribution systems required in Virginia and recognized nationally is a distinctive shade of purple, Pantone 522.

Cross connection and back flow prevention programs are required for reclaimed water distribution systems. These programs must describe measures to prevent reclaimed water from entering drinking water supply lines and to prevent contamination of the reclaimed water distribution system by backflow.

Reclaimed water has been reused successfully in the United States for more than 20 years, particularly in Florida, California and southwestern states.

►*Where can I find more information about water reclamation and reuse?*

More specific information regarding the regulation of water reclamation and reuse in Virginia and possible funding for publicly owned water reclamation and reuse projects is available on DEQ's water reclamation and reuse program page at www.deq.virginia.gov/vpa/waterreuse.html.

General information about water reclamation and reuse can be obtained from the WateReuse Association at www.watereuse.org. The U.S. EPA also has an informative publication entitled *"Guidelines for Water Reuse" (2004)* that can be downloaded at no cost from www.epa.gov/ord/NRMRL/pubs/625r04108/625r04108.htm.